

Bluewater Creek Abstract

The Stream Sediment Investigation of Bluewater Creek was initiated in May, 1960 to measure effects of sediment, flows and water temperature on trout populations, bottom insects and trout egg incubation.

During winter months, when no water is diverted from the stream, there is little fluctuation in the rate of flow. Severe fluctuations occur during the irrigating season. Sediment concentrations are smallest upstream and generally increase progressively downstream. The higher sediment concentrations in the lower areas produce a marked decrease in water quality.

Bluewater Creek originates from a series of springs with a constant temperature, travels 13 miles and flows into the Clark's Fork of the Yellowstone River. Increased sediment concentrations in the lower area have caused higher summer temperatures than would be expected in clean water.

All measurements to date have shown the detrimental effects of sediment on trout egg survival and on trout populations. In the clean headwaters of Bluewater Creek, brown trout represent almost the entire fish population. Sampling at intervals from the headwaters to the confluence of Bluewater with the Clark's Fork shows a progressive decrease in the number of brown trout and an increase in the number of rough fish. Trout egg survival was nearly 100 percent successful in the headwaters and totally unsuccessful near the mouth. Sucker eggs survived throughout the drainage.

The detrimental effects of sediment to the trout population were obvious to the investigators of this study. The nature of the study was then altered to evaluate the major factors causing sedimentation in Bluewater Creek and to evaluate corrective measures taken to reduce this sediment.

Three streambank improvement projects were developed in the spring of 1966. A pipeline was installed to control erosion from a waste-water ditch. Several

hundred feet of eroded streambank were lined with rock riprapping. As part of the Fishing Access Program, approximately 100 acres, including one-half mile of stream was fenced to restrict cattle and reduce streambank trampling and subsequent erosion.

During the period 1960 to 1965, the average sediment load was 14 tons per day at the sampling area immediately downstream from the improved area. After improvements in 1966 and through 1967, the sediment load was reduced to 8 tons per day below the improvements.

Fish populations sampled by electrofishing immediately downstream from the improvement projects revealed that the brown trout:rough fish ratio by weight was 39:61 before improvements compared to 78:22 after streambank improvement projects. This represents a 39 percent increase in brown trout population. Six miles downstream from the improvement projects the brown trout:rough fish ratio by weight was 12:88 before improvements and 51:49 after improvements, also a 39 percent increase in trout.